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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,676	04/19/2001	Robert R. Hayes	B-4093 618554-9	8155

7590 09/11/2002

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EXAMINER
MENEFEE, JAMES A

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/838,676	HAYES, ROBERT R.	
	Examiner	Art Unit	
	James A. Menefee	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

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Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 19 April 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,7 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "365" in Fig. 3. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 20 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no discussion in the specification of the open circuit claimed in claim 20. While the specification does mention that the electrode may stop at the edge of the laser and not be connected to an external impedance, this is not the same thing as showing an open circuit.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 recites the limitation "the electrical signal" in line 9. There is insufficient antecedent basis for this limitation in the claim. The claim should read "an electrical signal".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 9-11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Gorfinkel et al. (US 5,311,526). Gorfinkel discloses the claimed invention as follows in Figs. 1-4 and the discussion thereof:

Regarding claims 1 and 9, Gorfinkel discloses a frequency modulated laser comprising a laser cavity comprising electrically sensitive material, said laser cavity having length and width dimensions, and said laser cavity producing laser light propagating parallel to the length dimension of the laser cavity, and means for applying a uniform electric field across said laser cavity, said electric field propagating in a direction substantially perpendicular to the direction of

propagation of the laser light, and having substantially the same intensity along the length dimension of the laser cavity at any point in time.

Regarding claims 2-4, the means for applying an electric field include a traveling wave structure comprising electrodes 24, 25, said traveling wave structure having a length and width at least as large as the width and length of the laser cavity, and propagating an electric field along a length of the traveling wave structure.

Regarding claims 5 and 10, the laser cavity is a semiconductor structure.

Regarding claims 6, 11, and 13 the laser cavity is pumped from the side.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7-8, 12, 14-18, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorfinkel. Gorfinkel discloses the limitations of claims 1-6, 9-11, and 13, but does not disclose the following:

Regarding claims 7 and 14, it is not disclosed that the cavity comprises doped lithium niobate. However, it is disclosed that the cavity comprises electro-optic material. Lithium niobate is a known electro-optic material that is often used in laser cavities. It would have been obvious to one skilled in the art to include lithium niobate in the cavity, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its

suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claims 8, 17, and 23, it is not disclosed that the laser cavity includes an index grating having a dielectric constant that changes due to a change in the electric filed applied. Examiner takes Official Notice that it is well known in the art to include a grating in a laser, said grating having a dielectric constant that changes due to an applied electric field. It would have been obvious to one skilled in the art to include such a grating because it can be used to select the wavelength of operation and thus tune the laser, as is well known.

Regarding claim 12, it is not disclosed that the laser is optically pumped. Optically pumped lasers are well known in the art. It would have been obvious to one skilled in the art to utilize optical pumping rather than electrical pumping because optical pumping has been shown to produce long wavelengths, while electrical pumping has been commercially unsuccessful at high wavelengths, as is well known.

Regarding claim 15 and 18, it is not disclosed that the electric field applied across the traveling wave structure is a radio frequency field. It is known in the art to excite a laser cavity using RF rather than the typical AC/DC excitation. It would have been obvious to one skilled in the art to use RF excitation in Gorfinkel's laser because RF excitation is superior as far as chemical stability and optical quality of the lasing medium, as is well known.

Regarding claim 16, the limitations are disclosed as in the rejection of claim 4 above.

Regarding claim 20, it is not disclosed that the traveling wave structure is terminated by an open circuit. However, on one side of the cavity the electrode stops at the edge of the external cavity, similar to that disclosed by the applicant. Should the applicant argue that the 35 USC 112

first paragraph rejection above is not valid, then the limitations of claim 20 will be met as shown herein.

Regarding claims 21-22, these limitations are disclosed by Gorfinkel as in the rejections of claims 5-6 above respectively.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gorfinkel in view of Laakmann (US 5,602,865). Gorfinkel teaches all of the limitations of claim 18 as shown above, but does not disclose that the traveling wave structure is terminated by an external impedance device having impedance equal to the characteristic impedance of the traveling wave structure. Laakmann teaches that it is well known to utilize feedback so that the impedances as claimed are matched, i.e. an effective external impedance will terminate the traveling wave structure. It would have been obvious to one skilled in the art to include such an external impedance because it improves the efficiency and stability of the laser, as taught by Laakmann.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
August 28, 2002

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